Docket No. 1422-0611P
(PATENT)

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

In Re Application of:	:	Confirmation No.: 7359
Kenichi SUENAGA et al.	:	Group Art Unit: 1755
Serial No. 10/727,571	:	Examiner: MARCHESCHI,
Filed: December 5, 2003	:	Michael A.
For: POLISHING COMPOSITION		

DECLARATION UNDER 37 C.F.R. 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Yoshiaki OSHIMA, residing at Wakayama-ken, Japan, hereby declare and state as follows:

1. That I am one of the co-inventors of U.S. Application Serial No. 10/727,571 filed on December 5, 2003. I am thoroughly familiar with the contents of said Application, its prosecution before the United States Patent and Trademark Office and the references cited therein.

2. That I am a graduate of Kyoto University, Department of Engineering and received a master's degree in the year 1996, majoring in chemistry.

3. That I have been employed in Kao Corporation in the year 1996 and have been assigned to the Research Laboratories.

4. That I have been involved in the research and development of polishing composition since the year 1998.

5. That the following calculation was conducted by myself or under my direct supervision and control in order to verify that particle size distribution on volume-base cannot be determined according to a partial disclosure of the particle size distribution on number-base.

EXPERIMENTAL METHOD

As to the group of particles composed of twenty particles shown in the following Tables A and B, of which particle size is only different in Particle No. 20 between the two groups (Table A: 68 nm; Table 2: 120 nm), D10, D50 and D90 of each group of particles on volume-base or on number-base were obtained. Here, D10, D50 and D90 are respectively particle sizes of which cumulative particle size distribution counted from a smaller particle size is 10%, 50%, and 90%.

Table A

particle No.	particle size (nm)	cumulative particle size distribution (number base %)		volume of a particle (nm^3)	cumulative volume (nm^3)	cumulative particle size distribution (volume base %)	
1	40	5		33510	33510	1.9	
2	43	10	D10	41630	75140	4.3	
3	45	15		47713	122853	7.0	
4	46	20		50965	173818	10.0	D10
5	47	25		54362	228180	13.1	
6	48	30		57906	286085	16.4	
7	49	35		61601	347688	19.9	
8	50	40		65450	413138	23.7	
9	51	45		69458	482592	27.6	
10	55	50	D50	87114	569706	32.8	
11	56	55		91952	661658	37.9	
12	57	60		96967	758625	43.5	
13	58	65		102160	860785	49.3	
14	59	70		107536	968322	55.5	D50
15	60	75		113097	1081419	62.0	
16	61	80		118847	1200266	68.8	
17	62	85		124788	1325054	75.9	
18	62	90	D90	124788	1449842	83.1	
19	63	95		130924	1580767	90.6	D90
20	68	100		164636	1745403	100.0	

Table B

particle No.	particle size (nm)	cumulative particle size distribution (number base %)		volume of a particle (nm^3)	cumulative volume (nm^3)	cumulative particle size distribution (volume base %)	
1	40	5		33510	33510	1.3	
2	43	10	D10	41630	75140	3.0	
3	45	15		47713	122853	4.9	
4	46	20		50965	173818	7.0	
5	47	25		54362	228180	9.2	
6	48	30		57906	286085	11.5	D10
7	49	35		61601	347686	14.0	
8	50	40		65450	413136	16.6	
9	51	45		69456	482592	19.4	
10	55	50	D50	87114	569706	22.9	
11	56	55		91952	661658	26.6	
12	57	60		96967	758625	30.5	
13	58	65		102160	860785	34.6	
14	59	70		107536	968322	39.0	
15	60	75		113097	1081419	43.5	
16	61	80		118847	1200266	48.3	
17	62	85		124788	1325054	53.3	D50
18	62	90	D90	124788	1449842	58.3	
19	63	95		130924	1580767	63.6	
20	120	100		904779	2485545	100.0	D90

RESULTS

In the group of Table A, D10, D50 and D90 on number base were 43 nm, 55 nm and 62 nm, respectively, and D10, D50 and D90 on volume base were 46 nm, 59 nm and 63 nm, respectively.

Whereas, in the group of Table B, D10, D50 and D90 on number base were 43 nm, 55 nm and 62 nm, respectively, and D10, D50 and D90 on volume base were 48 nm, 62 nm and 120 nm, respectively.

DISCUSSION

It can be seen from the above that the relationship between the cumulative particle size distribution on number-base and the cumulative particle size distribution on volume-base changes dramatically due to a difference in particle sizes of a part of the entire particles.

In other words, when particle sizes of the entire particles are partially unknown, the particle size distribution on volume-base cannot be determined according to a partial disclosure of the particle size distribution on number-base.

6. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

7. Further declarant saith not.

Yoshiaki Oshima

Yoshiaki OSHIMA

April 4, 2006

Date

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2. That I am a graduate of Kyoto University, Department of Engineering and received a master's degree in the year 1996, majoring in chemistry.

3. That I have been employed in Kao Corporation in the year 1996 and have been assigned to the Research Laboratories.

4. That I have been involved in the research and development of polishing composition since the year 1998.

5. That the following experiments were conducted by myself or under my direct supervision and control in order to verify that the present invention is unobvious from the disclosure of Ota et al. (U.S. 2004/0110711).

EXPERIMENTAL METHOD

Comparative Examples 1 to 5 of the present specification have the particle size distributions corresponding to Examples (α, β, γ, δ, ε, η, θ, and ζ) of Ota (See the following Table A). In order to clarify that these comparative examples fall away from the range of the particle size distribution as defined by the formula of the present invention, and that Examples of the present invention fall within the range of the particle size distribution, the ranges of the particle size distributions of the silica particles defined by the formulas (1) and (5) are respectively incorporated by hand-writing into Figures 1 and 2 of the originally filed drawings, and shown in Figures 1(a) and 2(a).

Table A

Comparative Examples of the Present Invention	1	2	3	4	5
Examples of Ota	α, β	γ	δ	ε, η, θ	ζ

RESULTS

FIG. 1(a)

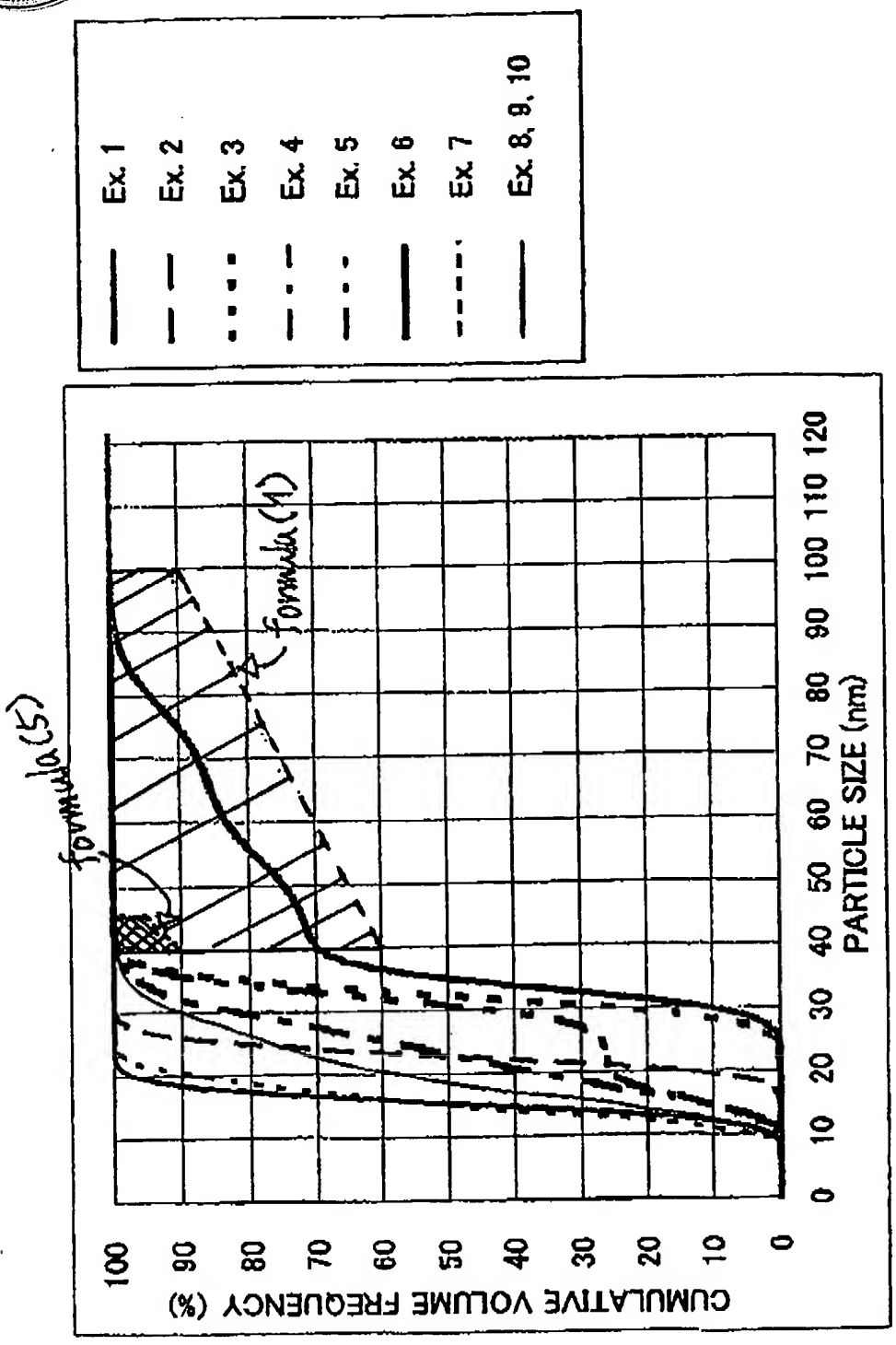
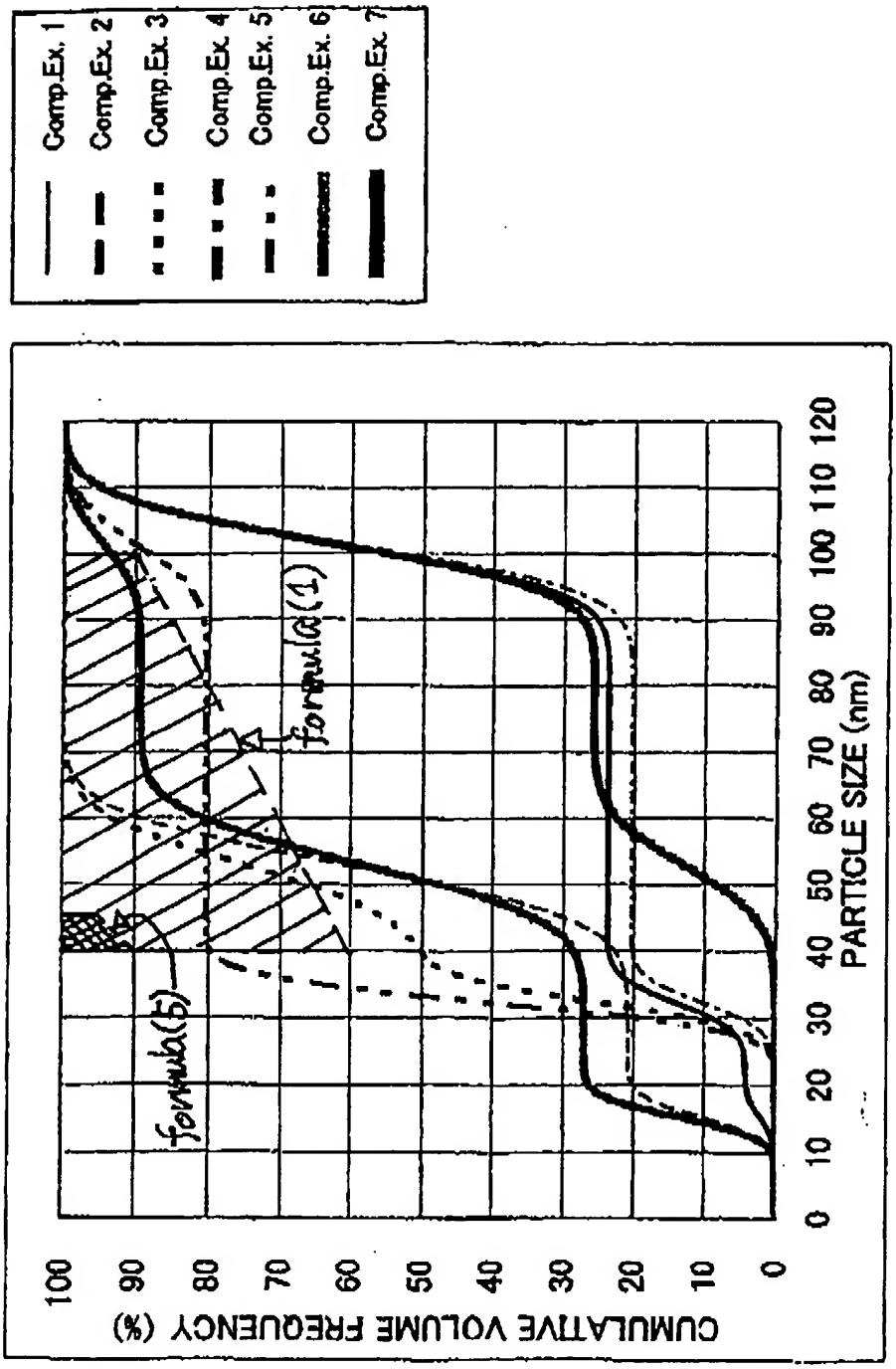


FIG. 2(a)


Comp.Ex. 1
Comp.Ex. 2
Comp.Ex. 3
Comp.Ex. 4
Comp.Ex. 5
Comp.Ex. 6
Comp.Ex. 7
formula(1)
formula(5)
CUMULATIVE VOLUME FREQUENCY (%)
100 90 80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80 90 100 110 120
PARTICLE SIZE (nm)

As shown in Figure 2(a), it can be seen that Comparative Examples 1 to 5 corresponding to Examples (α, β, γ, δ, ε, η, θ, and ζ) of Ota do not satisfy the particle size distribution as defined in the formula (1) of the present invention. Further, it can be seen that these comparative examples fall far away from the range of the more preferred particle size distribution of the present invention as defined in the formula (5).

On the other hand, as shown in Figure 1(a), all the Examples 1 to 10 of the present invention are within the range of the particle size distribution as defined in the formula (1). Further, it is shown that Examples 1 to 5 and 7 to 10 of the present invention having superior effects in reducing surface roughness as compared to Example 6 (see Table 2 of the present specification) satisfy not only the formula (1) but also the formula (5).

DISCUSSION

Taking into consideration that Ota neither discloses nor suggests the derivation of the formulas of the present invention, and that Comparative Examples 1 to 5 corresponding to Examples (α, β, γ, δ, ε, η, θ, and ζ) disclosed as preferred embodiments of Ota fall away from the range defined by the formulas of the present invention as shown in Figure 2(a), the present invention is unobvious over Ota.

In addition, the since Ota discloses a combination of monomodal abrasives, there is an open portion in the particle size distribution disclosed in Ota. Here, the particle size distribution on volume-base cannot be determined on the basis of the particle size distribution on number-base in particles of which particle sizes are partially unknown. Therefore, the formulas of the present invention cannot be derived from the particle size distribution of Ota of which

particle sizes are partially unknown. Therefore the present invention is unobvious from Ota.

6. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

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